Express Mail No.: **EL656358020US** Date: **December 29, 2000**

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

BARBARA ERNZERHOFF-SNOW
(Name of person mailing paper or fee)

(Signature)

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

Attorney's Docket No: **GREUBEL**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE99/01765	June 16, 1999	June 29, 1998

TITLE OF INVENTION
LINEAR SYNCHRONOUS MOTOR

APPLICANT(S) FOR DO/EO/US
KLAUS GREUBEL & AXEL KNAUFF

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.

2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.

3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [X] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US)

6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.

8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

9. [ ] Original or facsimile of an oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).

10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. concern other document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. [X] A **FIRST** preliminary amendment.
    [ ] A **SECOND** or **SUBSEQUENT** preliminary amendment.

14. [ ] A substitute specification.

15. [ ] A change of power of attorney and/or address letter.

16. [X] Other items or information: International Search Report and Form PTO-1449

U.S.APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NO.
09/720709	PCT/DE99/01765	GREUBEL

17. [X] The following fees are submitted : BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5)):	
[X] For filing with EPO or JPO search report (37 C.F.R. 1.492(a)(5)) $ 860.00	$860.00
[ ] International preliminary examination fee paid to USPTO (37 C.F.R. 1.492(a)(1)) $ 690.00	
[ ] No international preliminary examination fee paid to USPTO (37 C.F.R. 1.492(a)(2)) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) $ 710.00	
[ ] Neither international preliminary examination fee paid to USPTO (37 C.F.R. 1.492(a)(3)) nor international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) $1,000.00	
[ ] International preliminary examination fee paid to USPTO (37 C.F.R. 1.492(a)(4)) and all claims satisfied provisions of PCT Articles 33(2)-33(4) $ 100.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	

Claims	Number Field	Rate	
Total Claims	13-20	x $ 18.00	
Independent Claims	2-3	x $ 80.00	
Multiple dependent claims (if applicable)		x $270.00	
		TOTAL OF ABOVE CALCULATIONS	$860.00
[ ] Applicant claims small entity status pursuant to 37 C.F.R. 1.27. Reduction by 1/2 for filing by small entity.			
		SUBTOTAL	$860.00
Processing fee of $130.00 for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date 37 CFR 1.492(f).			
		TOTAL NATIONAL FEE	$860.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +			$ 0.00
		TOTAL FEES ENCLOSED	$860.00
		Amount to be refunded	
		charged	

a. [X] A check in the amount of **$860.00** to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. **06-0502** in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **06-0502**. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.

Send all correspondence to:

HENRY M. FEIEREISEN
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Ursula B. Day

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Registration No. 47,296

09/720709

PATENT

526 Rec'd PCT/PTO 29 DEC 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No.: GREUBEL

In re Application of:	)
	)
KLAUS GREUBEL & AXEL KNAUFF	)
	)
Int. Appl. No.: PCT/DE99/01765	)
	)
Int. Filing Date: June 16, 1999	)
	)
For: LINEAR SYNCHRONOUS MOTOR	)

FIRST PRELIMINARY AMENDMENT

Express Mail mailing label number **EL656358020US**
Date of Deposit **December 29, 2000**
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1 10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

BARBARA ERNZERHOFF-SNOW
(Name of person mailing paper or fee)

(Signature)

Assistant Commissioner for Patents
Washington, D.C. 20231

S I R:

Preliminary to the first Official Action in the above-entitled application, please amend the application as follows:

VERSION WITH MARKINGS TO SHOW CHANGES MADE:

IN THE SPECIFICATION:

Page 1, before the title, delete "Description".

Before paragraph **[0001]**, change "Description" to --BACKGROUND OF THE INVENTION--.

Before paragraph **[0010]**, add the heading --SUMMARY OF THE INVENTION--.

Before paragraph **[0031]**, add the heading --BRIEF DESCRIPTION OF THE DRAWING--.

Before paragraph **[0035]**, add the heading --DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS--.

Page 12, after the heading "CLAIMS" and before the first claim add --What is claimed is:--.

<u>IN THE CLAIMS</u>:

Amend the following claims:

Claim 4, line 1, change "one of the preceding claims" to --claim 1--.

Claim 5, line 1, change " one of claims 1, 2 or 3" to --claim 1--.

Claim 6, line 1, change "one of the preceding claims" to --claim 1--.

Claim 7, line 1, change "one of the preceding claims" to --claim 1--.

Add the following claims:

8. (New) A linear synchronous motor, comprising:

- at least one primary part defined by a length and having slots for receiving monophase or polyphase windings, said primary part having end pieces extending perpendicular to a direction of movement of the linear motor;
- at least one secondary part having a series of poles formed by permanent magnets, said secondary part defined by a length which is greater than the length of the primary part in a direction of movement of the linear motor;
- means, associated to the primary part, for changing the magnetic force in the direction of movement of the linear motor in the region of the end pieces of the primary part,
- wherein an air gap of the end pieces is formed in such a way that a continuous change occurs in the magnetic force in the movement direction of the linear motor in the region of the end pieces of the primary part.

9. (New) The linear synchronous motor of claim 8, wherein each said end piece has a part adjacent the air gap, said part of the end piece having a geometry selected in accordance with the following relationship:

$$y(x) = \delta_0 \left[\frac{1}{\sqrt{1 - \frac{x}{x_0} \cdot \left[1 - \left(\frac{1}{1 + \frac{y_0}{\delta_0}} \right) \right]}} - 1 \right]$$

wherein

δ_0 is the magnetically active air gap between the secondary part and the primary part, including a height of the permanent magnets,

x_0 is the extent of the part of the end piece in the direction of movement of the linear motor having a non-constant air gap,

y_0 is a height of the part of the end piece having a non-constant air gap at x_0 and,

$y(x)$ is the coordinate of the part of the end piece having a non-constant air gap at the point x.

10. (New) The linear synchronous motor of claim 8, wherein a pole gap is defined between neighboring poles of the secondary part at an angle which differs from 90° with respect the direction of movement of the linear motor.

11. (New) The linear synchronous motor of claim 8, wherein the pole gap has a varying gap width.

12. (New) The linear synchronous motor of claim 8, wherein the end pieces include at least one partial stack of laminations made of ferromagnetic material and directed essentially perpendicular to the direction of movement of the linear motor.

13. (New) The linear synchronous motor of claim 8, wherein the end pieces are configured for attachment onto the primary part.

REMARKS

This Amendment is submitted preliminary to the issuance of an Office Action in the present application.

Applicant has amended claims 4 to 7 to remove any multiple dependency of the claims, and submits herewith new claims 8 to 13. No new matter has been added. In addition, applicant has amended the specification to present it with proper headings.

When the Examiner takes this application up for action, he is requested to take the foregoing into account.

The Commissioner is hereby authorized to charge fees which may be required, or credit any overpayment to Deposit Account No. 06-0502.

Respectfully submitted,

By: _____
Ursula B. Day
Attorney For Applicant
Reg. No. 47,296

Date: December 29, 2000
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Description

LINEAR SYNCHRONOUS MOTOR

[0001] The invention relates to a linear synchronous motor.

[0002] Synchronous motors which are used as actuating motors should develop power in a way which is as uniform and free from interference as possible.

[0003] In the case of rotary synchronous motors, it is essentially the slotting of the stator which comes into consideration for causing periodic power fluctuations, also generally termed cyclic power variation. In order to compensate this cyclic power variation and other further effects, caused by the slotting, on the torque at the drive shaft, the rotor and/or stator poles are usually skewed over the width of a slotting.

[0004] It is also known, from US 4,908,533, in the case of linear synchronous motors to bevel the poles over the width of a slot of the wound primary part in order to avoid the cyclic power variation. Since the edges of the end faces of the primary part run parallel to its slots in plan view, skewing results at the front and rear end edges of the poles in the case of the known slot skewing.

[0005] A further possibility, known from EP 0 334 645 A1, for reducing the cyclic power variation consists in designing the core of the primary part of a linear synchronous motor as a ferromagnetic plate, and arranging coils in the air gap of the linear motor such that the end regions of the plate project over the air gap coils and form a step in the region of the longitudinal mid line of the linear motor.

[0006] Unlike the rotary synchronous motors, which continue endlessly viewed in the circumferential direction, a linear synchronous motor has, as a particular feature, a start and an end. In the case of a linear synchronous motor, periodic motor end forces, which can have a disturbing effect on the continuous movement of the linear motor, are produced in the direction of movement at the transitions at the start and at the end.

[0007] The motor end forces are produced because the linear motor covers the magnetic poles differently depending on the motor position. There are preferred positions in this case, in which the stored magnetic energy of the linear motor is particularly high. An additional expenditure of force is required to move the linear motor out of such preferred positions. There is a preferred position over each magnet pole.

[0008] The pole force therefore varies periodically in relation to the magnet poles, and this leads to a disturbance in the motor power which is denoted as cyclic pole variation. Since the pole force is not a function of the motor current, it

constitutes a passive force which is also present in the de-energized state. The pole force does not perform any work, since it acts alternately in the direction of movement and against the direction of movement of the linear motor. In operation, it is added to the force produced by the motor current. The pole force has nothing in common with the slot force with which the magnet pole edges and the stator slots act on one another.

[0009] The cyclic pole variation described leads to inaccurate movement of conventional linear synchronous motors, and this is particular undesirable when these motors are used as precision actuators.

[0010] Consequently, it is an object of the invention is to provide a linear synchronous motor which is capable to virtually completely suppress the cyclic power variation.

[0011] According to the invention, this object is achieved by means of a linear synchronous motor having the following features:

[0012] - at least one primary part and at least one secondary part,

[0013] - the secondary part has a series of poles formed by permanent magnets,

[0014] - the length of the secondary part is greater than the length of the primary part in the direction of movement,

[0015] - the primary part has slots which are suitable for holding monophase or polyphase windings,

[0016] - the primary part has means which lead to a change in the magnetic force in the direction of movement of the linear motor in the region of the end pieces of the primary part, and

[0017] - the end faces of the end pieces extend perpendicular to the direction of movement of the linear motor.

[0018] In the linear synchronous motor according to the invention, the air gap is formed in the region of the end pieces of the primary part in such a way that it varies from section to section. The end faces of the end pieces are designed in parallel and perpendicular to the direction of movement in each case. The cyclic power variation is substantially reduced hereby while yet maintaining the compact design of the linear synchronous motor virtually unchanged.

[0019] The air gap of the end pieces is formed in a further embodiment in such a way that the change in the magnetic force on the end pieces is continuous in the case of a relative movement of the primary and secondary parts. Because of the formation of the end pieces of the primary part in accordance with the invention, for each pole force contribution at the front side of the linear motor there is exactly one pole force contribution of equal and opposite magnitude at the rear side of the linear motor. The formed end pieces of the primary part are preferably not slotted and wound.

[0020] In a further embodiment, the parts of the end pieces of the primary part, that face the air gap, have a geometry which is selected in accordance with the following relationship,

$$y(x) = \delta_0 \left[\frac{1}{\sqrt{1 - \frac{x}{x_0} \cdot \left[1 - \left(\frac{1}{1 + \frac{y_0}{\delta_0}} \right) \right]}} - 1 \right]$$

[0021] wherein δ_0 is the magnetically active air gap between the secondary part and the primary part, including the height of the permanent magnets,

[0022] x_0 is the extent of the part of the end piece in the direction of movement of the linear motor having a non-constant air gap,

[0023] y_0 is a height of the part of the end piece having a non-constant air gap at x_0 and,

[0024] y(x) is the coordinate of the part of the end piece having a non-constant air gap at the point x.

[0025] In this case, the magnetic force on the end pieces decreases and increases linearly in the case of relative movement of the primary part and secondary part. The length of the end pieces in the direction of movement of the linear motor can thereby be kept short, so that the spatial extent of the primary

part can be limited to the dimensions most necessary. The parameters are preferably selected as δ_0 = 5 mm, x_0 = 5 mm and y_0 = 4.2 mm.

[0026] In a further embodiment, the gaps, located between the poles, of the secondary part exhibit an angle differing from 90° with respect to the direction of movement of the linear motor. In the following, the term "pole" will be understood as an arrangement of, for example, at least one permanent magnet which has a north pole and a south pole. The skewing is preferably selected in the region of the width of a slot of the primary part. The pole skewing is to be increased or to be decreased together with the end piece forming of the primary part, depending on the selection of the parameters in accordance with the above relationship with reference to the profile of the end piece.

[0027] In a further embodiment, the gaps located between the poles are designed essentially perpendicular to the movement direction, but have different gap widths so as to further contribute to the reduction of the cyclic power variation also in this case.

[0028] The gap widths are to be enlarged or reduced together with end piece formation of the primary part, depending on how the parameters are selected in accordance with the above relationship with reference to the profile of the end piece.

[0029] In a further embodiment, the stack of ferromagnetic laminations is subdivided into several partial stacks of laminations extending perpendicular to the direction of movement of the linear motor, in order to optimize assembly and stockholding.

[0030] The formed end pieces of the primary part can preferably be produced separately and fitted on the primary part such that, depending on the primary part and intended use, the end pieces as such can be produced and assigned to the respective primary part. All known positive and non-positive types of connections can hereby be used.

[0031] The invention and further advantageous refinements of the invention in accordance with features of the subclaims are now explained in more detail with reference to exemplary embodiments shown schematically in the drawing, in which:

[0032] FIG. 1 shows a side view of a linear motor,

[0033] FIG. 2 shows an enlarged illustration of a detail of the side view of a linear motor, and

[0034] FIGS. 3, 4 show arrangements of permanent magnets of the secondary part.

[0035] FIG. 1 shows a side view of a linear synchronous motor according to the invention, typically including a primary part 1 and a secondary part 6. For reasons of clarity, an illustration of poles 10 has been omitted in FIG. 1. The direction of movement of the linear motor is indicated by an arrow 5. The length of the primary part 1 in the movement direction 5 is shorter than the length of the secondary part 6. The primary part 1 includes a layered stack 8 of laminations 8 with primary partial slots 9 which extend in parallel relationship for allowing placement of windings which are electrically excited by monophase or polyphase alternating current. Prefabricated field coils have proved to be particularly easy to assemble in this case. In the exemplary embodiment according to FIG. 1, the longitudinal axes of the primary partial slots 9 extend perpendicular to the longitudinal axis of the primary part 1, i.e. perpendicular to the movement direction 5. Skewed primary part slots 9 are also conceivable.

[0036] The stationary secondary part 6 includes a multiplicity of poles 10 which are arranged sequentially in the movement direction, with each one having a north pole 11 and a south pole 12. A narrow pole gap 13 of gap width P is located between the poles 10 which have each a width of W. In the exemplary embodiment according to FIG. 1 and FIG. 2, the longitudinal axes of the pole gaps 13 extend perpendicular to the longitudinal axis of the primary part 1, and are therefore orientated in the same way as the longitudinal axes of the primary partial slots 9 according to FIG. 1. When the winding in a primary part 1 is excited, a force is produced which moves the primary part 1, which, for example,

is fastened under a slide, relative to the stationary secondary part 6. The speed of the primary part 1 is hereby synchronous with respect to the frequency of the two-phase or three-phase alternating voltage for exciting the primary part 1. This is the reason for designating this linear type as a linear synchronous motor.

[0037] According to the invention, the end regions 14 of the stack 8 of laminations of the primary part 1 are of unslotted design; and in order to achieve a constant force profile of a magnet pole, the end pieces 2 of the primary part 1 are designed in accordance with the relationship

$$y(x) = \delta_0 \left[\frac{1}{\sqrt{1 - \frac{x}{x_0} \cdot \left[1 - \left(\frac{1}{1 + \frac{y_0}{\delta_0}} \right) \right]}} - 1 \right]$$

[0038] wherein δ_0 is the magnetically active air gap between the secondary part and the primary part, including the height 21 of the permanent magnets,

[0039] x_0 is the extent of the part of the end piece 2 in the direction 5 of movement of the linear motor having a non-constant air gap,

[0040] y_0 is a height of the part of the end piece 2 having a non-constant air gap at x_0 and,

[0041] y(x) is the coordinate of the part of the end piece 2 having a non-constant air gap at the point x.

[0042] The formed end pieces 2 may form a part of the stack 8 of laminations, but may also be attached as individual formed parts to the original stack 8 of laminations so that the stack of laminations can be fabricated in a conventional way with primary partial slots 9 and windings, and subsequently provided with the end pieces 2. The orientation of the laminated arrangement preferably corresponds to the orientation of the stack 8 of laminations. The end formed pieces 2 are connected to the stack 8 of laminations in a non-positive or positive manner 4.

[0043] In the further exemplary embodiments of the linear synchronous motor according to the invention, as illustrated in FIGS. 3 and 4, the longitudinal axes of the poles 10 of the secondary part 6 are skewed at an angle of 20 to the movement direction 5 in order to compensate the slot-induced cyclic power variation. This skewing of the poles 10 correlates with the formation of the end piece 2 of the primary part 1 such that a more or less pronounced skewing of the longitudinal axes of the poles 10 relative to the movement direction 5 may be required in order to obtain optimum compensation of the cycle power variation. It goes without saying that the skewing of the longitudinal axes of the primary part slots 9 in accordance with FIG. 4, and a variation in the pole gaps 13 between the poles 10 in accordance with FIG. 3 can also be jointly applied.

[0044] It is further possible to vary the configuration of the pole gaps 13 of obliquely arranged poles 10. Moreover, pole gaps 13 can also be aligned conically.

[0045] It is also possible to use poles 10 of different width W, whereby the individual poles 10 may also be formed from several permanent magnets.

[0046] Different poles 10 and pole gaps 13 can be formed by staggering these permanent magnets, which can also be of different design.

[0047] Permanent magnets of virtually any desired spatial formulation (for example different height 21, width W and length) can be used in order further to compensate the cyclic power variation.

CLAIMS

1. A linear synchronous motor which has the following features:

   a) at least one primary part (1) and at least one secondary part (6),

   b) the secondary part (6) has a sequence of poles (10) formed by permanent magnets,

   c) the length of the secondary part (6) is greater than the length of the primary part (1) in the movement direction (5),

   d) the primary part (1) has primary part slots (9) which are suitable for holding monophase or polyphase windings,

   e) the primary part (1) has means which lead to a change in the magnetic force in the movement direction (5) of the linear motor in the region of the end pieces (2) of the primary part (1), and

   f) the end faces (14) of the end pieces (2) extend perpendicular to the movement direction (5) of the linear motor.

2. The linear synchronous motor as claimed in claim 1, characterized in that the air gap of the end pieces (2) is formed in such a way that a continuous change occurs in the magnetic force in the movement direction (5) of the linear motor in the region of the end pieces (2) of the primary part (1).

3. The linear synchronous motor as claimed in claim 2, characterized in that the geometry of the parts, facing the air gap, of the end pieces (2) is selected in accordance with the following relationship:

$$y(x) = \delta_0 \left[\frac{1}{\sqrt{1 - \frac{x}{x_0} \cdot \left[1 - \left(\frac{1}{1 + \frac{y_0}{\delta_0}} \right) \right]}} - 1 \right]$$

wherein

δ_0 is the magnetically active air gap between the secondary part and the primary part, including the height of the permanent magnets,

x_0 is the extent of the part of the end piece in the direction of movement of the linear motor having a non-constant air gap,

y_0 is a height of the part of the end piece having a non-constant air gap at x_0 and,

y(x) is the coordinate of the part of the end piece having a non-constant air gap at the point x.

4. The linear synchronous motor as claimed in one of the preceding claims, characterized in that the gaps (13), located between the poles (10), of the secondary part (6) exhibit an angle (20) which differs from 90° with respect to the movement direction (5) of the linear motor.

5. The linear synchronous motor as claimed in one of claims 1, 2 or 3, characterized in that the gaps (13) located between the poles (10) have a varying gap width (P).

6. The linear synchronous motor as claimed in one of the preceding claims, characterized in that the end pieces (2) include at least one partial stack of laminations made of ferromagnetic material and directed essentially perpendicular to the direction of movement (5) of the linear motor.

7. The linear synchronous motor as claimed in one of the preceding claims, characterized in that the end pieces (2) are configured for attachment onto the primary part (1).

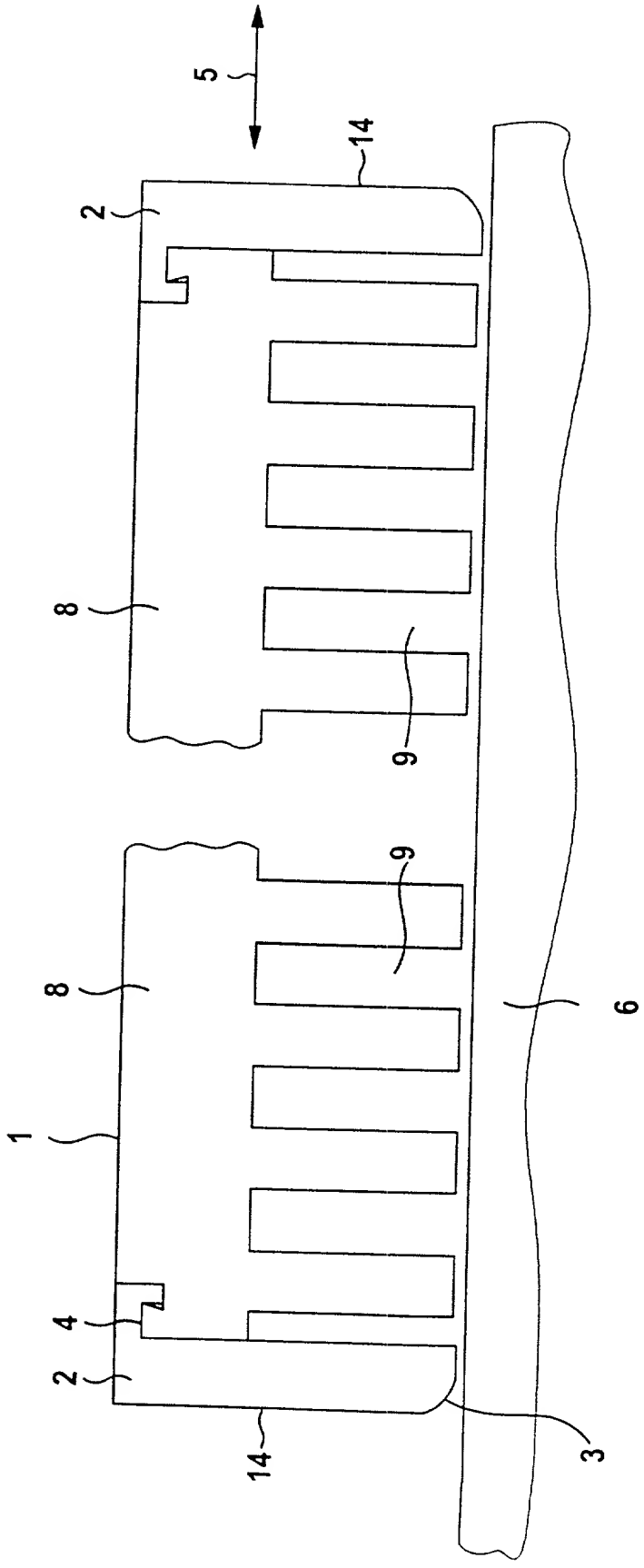

FIG 1

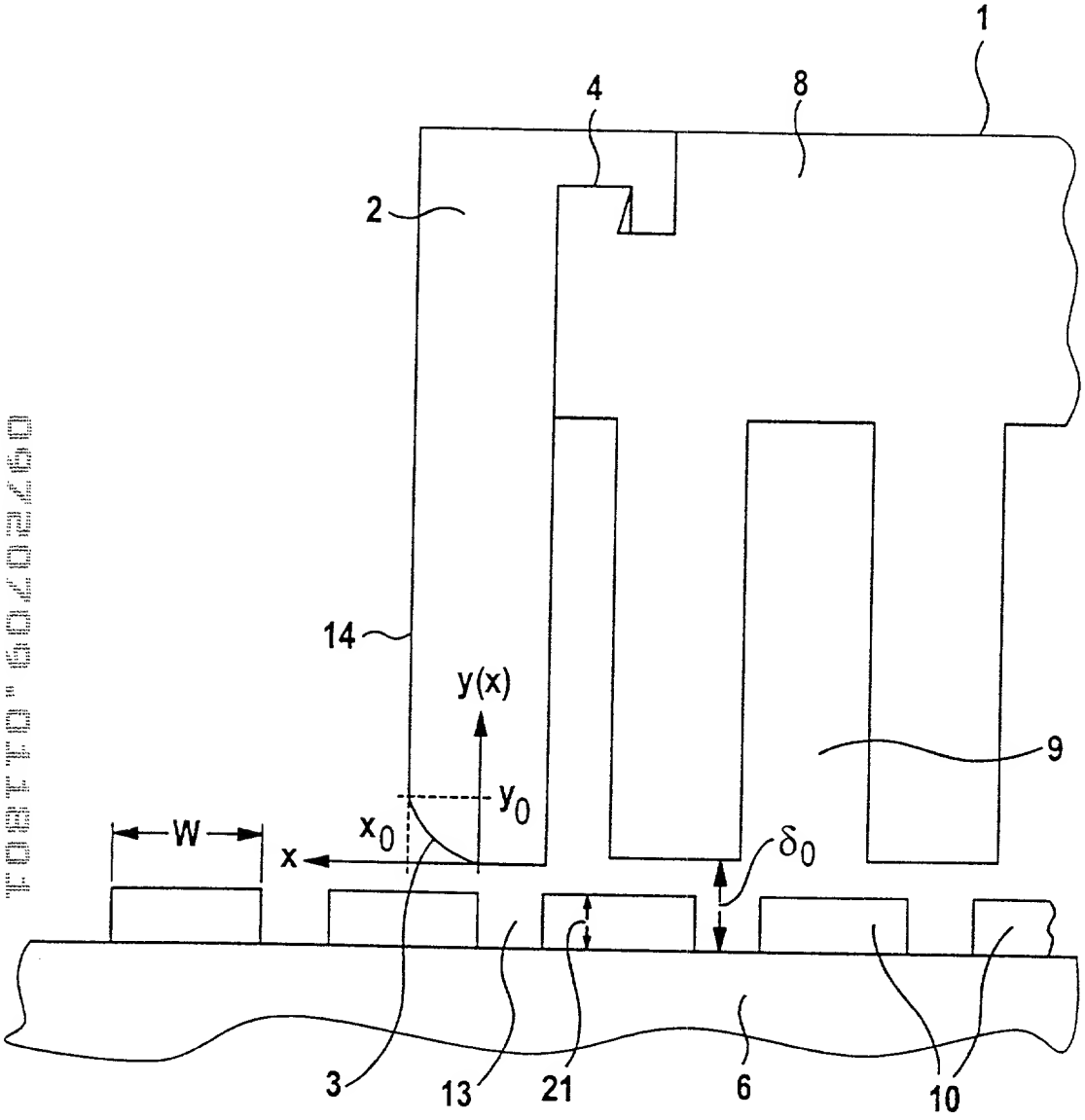

FIG 2

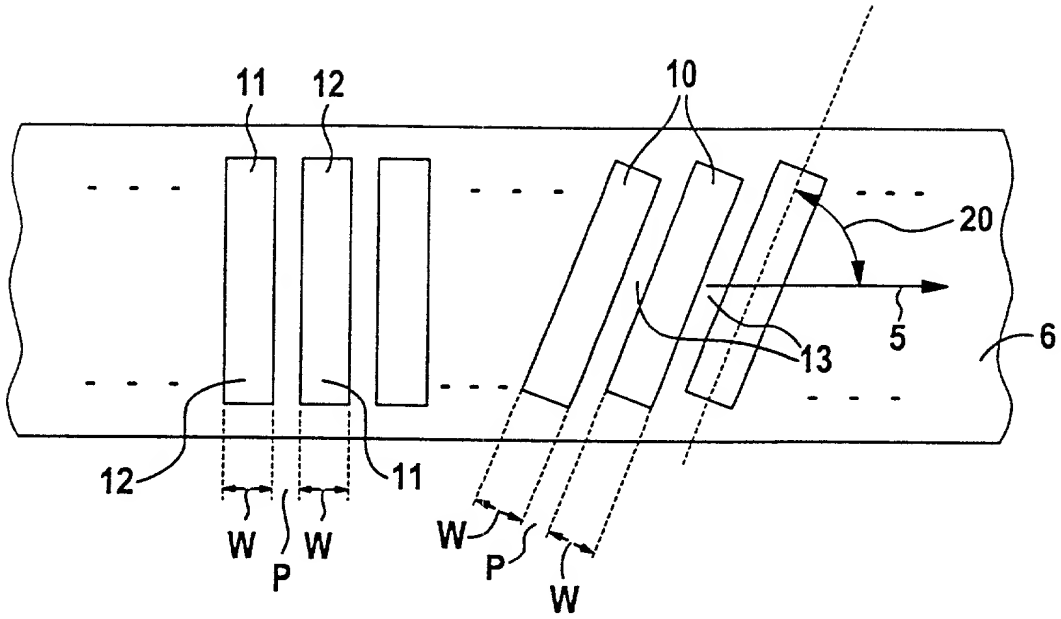

FIG 3

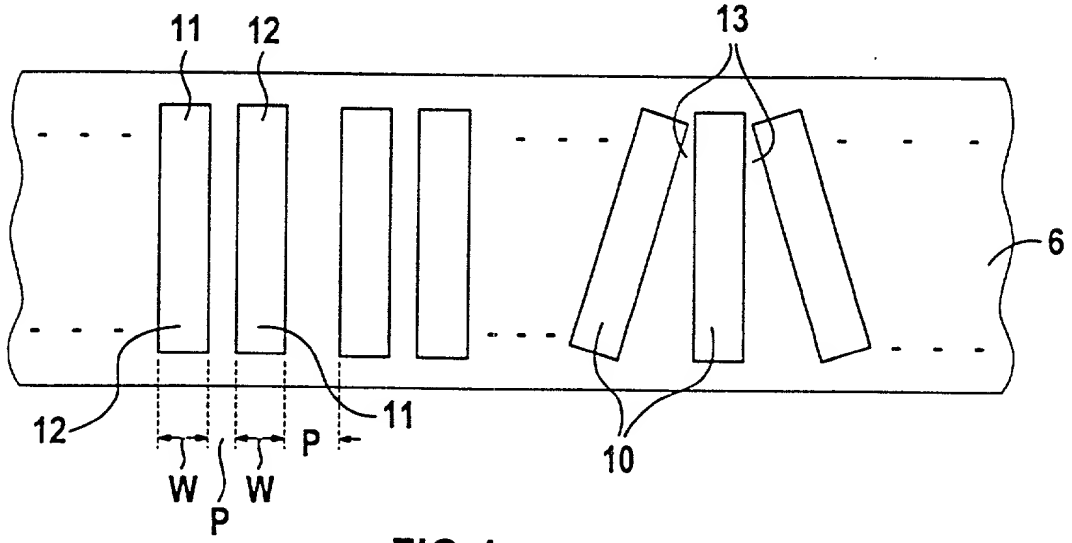

FIG 4

Prior Foreign Applications (Frühere ausländische Anmeldungen)			Priority Claimed? Priorität beansprucht?	
198 29 052.7	Germany	29/June/1998	[X]	[ ]
(Number) (Nummer)	(Country) (Land)	(Day/Month/Year Filed) (Tag/Monat/Jahr eingereicht)	Yes Ja	No Nein
			[ ]	[ ]
(Number) (Nummer)	(Country) (Land)	(Day/Month/Year Filed) (Tag/Monat/Jahr eingereicht)	Yes Ja	No Nein

Ich beanspruche hiermit gemäss Titel 35, US-Code, §119(e), den Vorzug aller unten aufgeführten US-Hilfsanmeldungen

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) below

(Application No. / Anmeldenr.)	(Filing Date / Anmeldedatum)
(Application No. / Anmeldenr.)	(Filing Date / Anmeldedatum)

Ich beanspruche hiermit gemäss Titel 35, US-Code, §120, den Vorzug aller unten aufgeführten US-Patentanmeldungen bzw. §365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung, bzw. PCT internationalen Anmeldung in einer gemäß dem ersten Absatz von Titel 35, US-Code §112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, §1.56 von Belang sind und im Zeitraum zwischen dem Anmeldedatum der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) gültigen internationalen Anmeldedatum bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Appl. No.) (Anmeldenr.)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig aufgegeben)	(Status) (patented, pending abandoned)
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Declaration and Power of Attorney for Patent Application
Erklärung für Patentanmeldungen mit Vollmacht
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SYNCHRONLINEARMOTOR

deren Beschreibung
(zutreffendes ankreuzen)

[ ] hier beigefügt ist.
[X] wurde angemeldet am 16. Juni 1999 unter der U.S.-Anmeldungs Nr. oder unter der Internationalen Anmeldenummer im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) PCT/DE99/01765 und am _____ abgeändert (falls zutreffend).

Ich bestätige hiermit, daß ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell duch einen Zusatzantrag, wie oben erwähnt, abgeändert wurde.

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As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYNCHRONLINEARMOTOR

the specification of which
(check one)

[ ] is attached hereto
[X] was filed on 16 June 1999 as United States Application Number or PCT International Application Number PCT/DE99/01765 and was amended on _____
(if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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